

**TEESSIDE UNIVERSITY
SCHOOL OF HEALTH & SOCIAL CARE**

SPSS Workbook 2 - Descriptive Statistics

Includes:

**Recoding variables
Cronbachs Alpha**

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SPSS– Workbook 2 – Descriptive Statistics

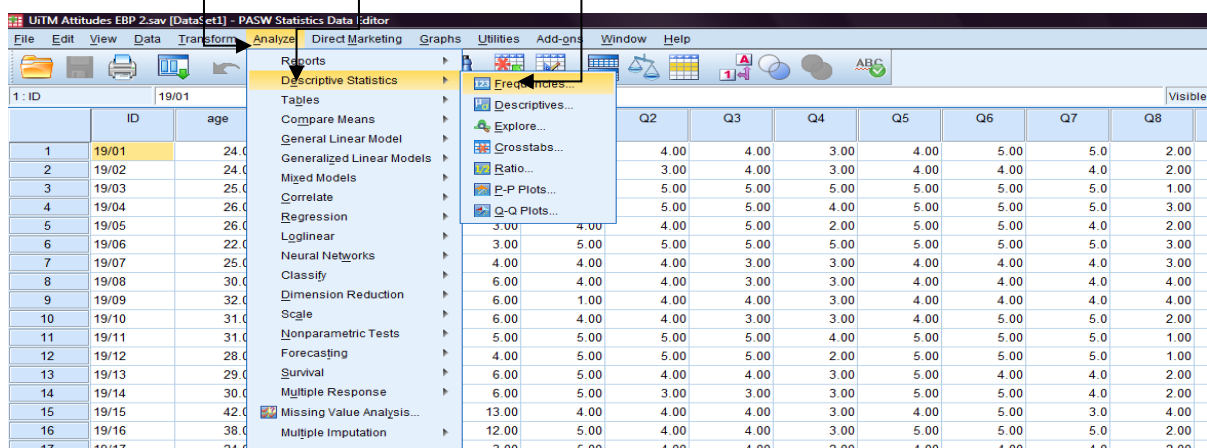
Accuracy of data input

Once you have entered your data into SPSS, you need to “clean-up” the data. This involves ensuring that data has been correctly entered. A good starting point for this is to run a frequency distribution for each of the variables eg:

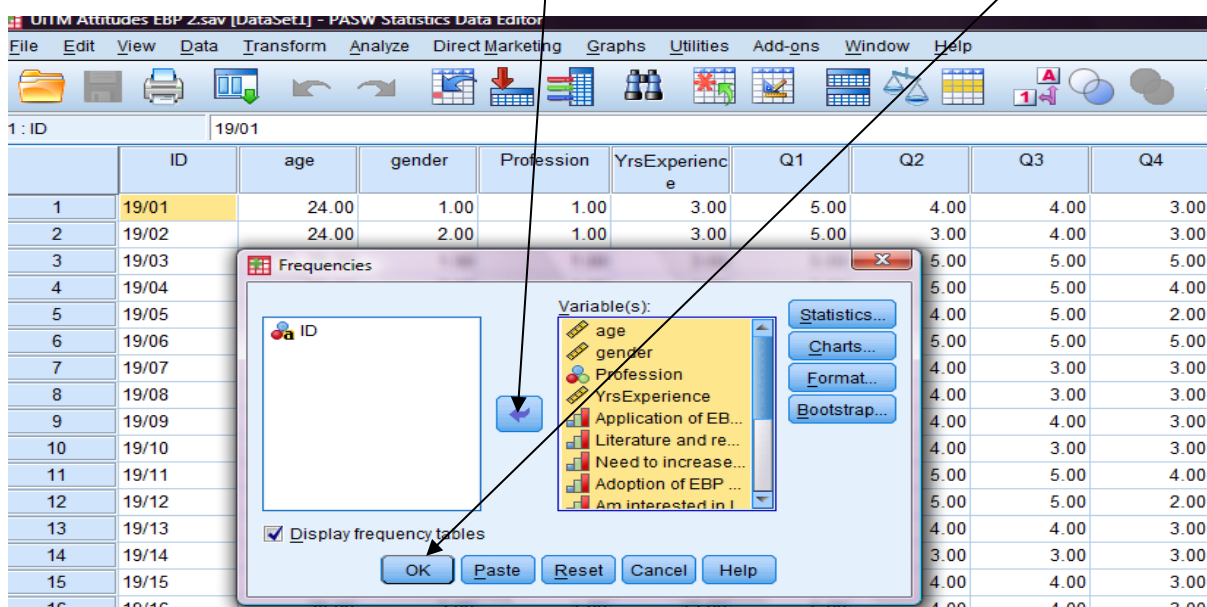
If you consider the variable “Gender” (1=male, 2=female) – then any other values entered would not fall into these categories eg 11, 12, 22. This is one of the most common mistakes when entering data into SPSS.

To check frequencies for all the variables:

Select **Analyse – Descriptive Statistics – Frequencies**



Move variables from the left hand column to the right hand column by highlighting the **variable name** and then clicking on the **arrow** to move the variable. Click on **OK** to finish.



When you have done this the frequencies will be displayed in a new output window. Look down the frequency tables and make a note of any variables that fall outside of the expected range:

Q1. Would this identify all mistakes? If not what other mistakes may be present?

Descriptive Statistics – Mean and Standard deviation

The following variables are interval/ratio level data

Age, Years of experience

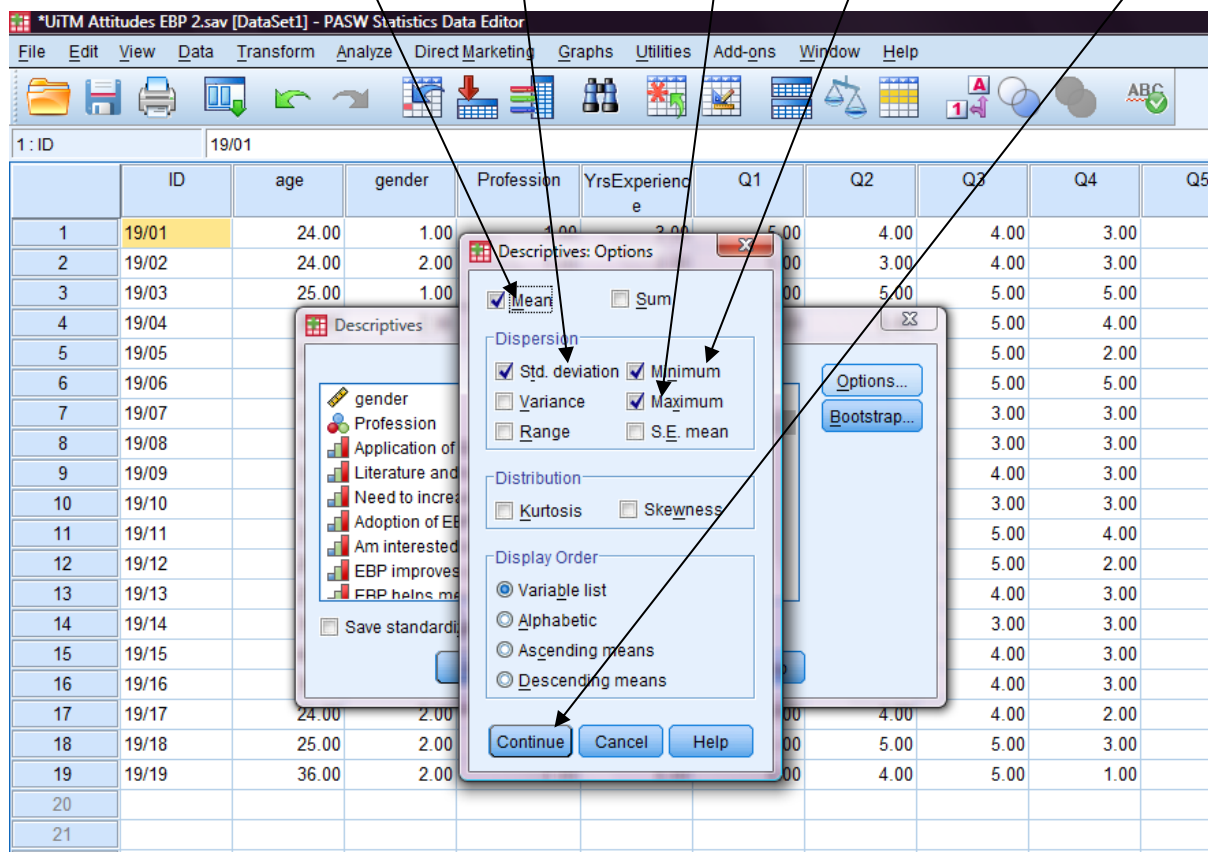
We are now going to obtain the following descriptive statistics:

Mean (measure of central tendency) and Standard deviation (SD = measure of dispersion)

This can be done in a number of ways but we will do this by selecting :

Analyse – Descriptive Statistics – Descriptives

Move the 2 variables into the right hand column and click on **Options**. Ensure that the following are selected **Mean, Standard deviation, Maximum, Minimum**. Now click **Continue** and then **OK** to finish.



Record the descriptive statistics for each variable:

Table 1 – Descriptive Statistics

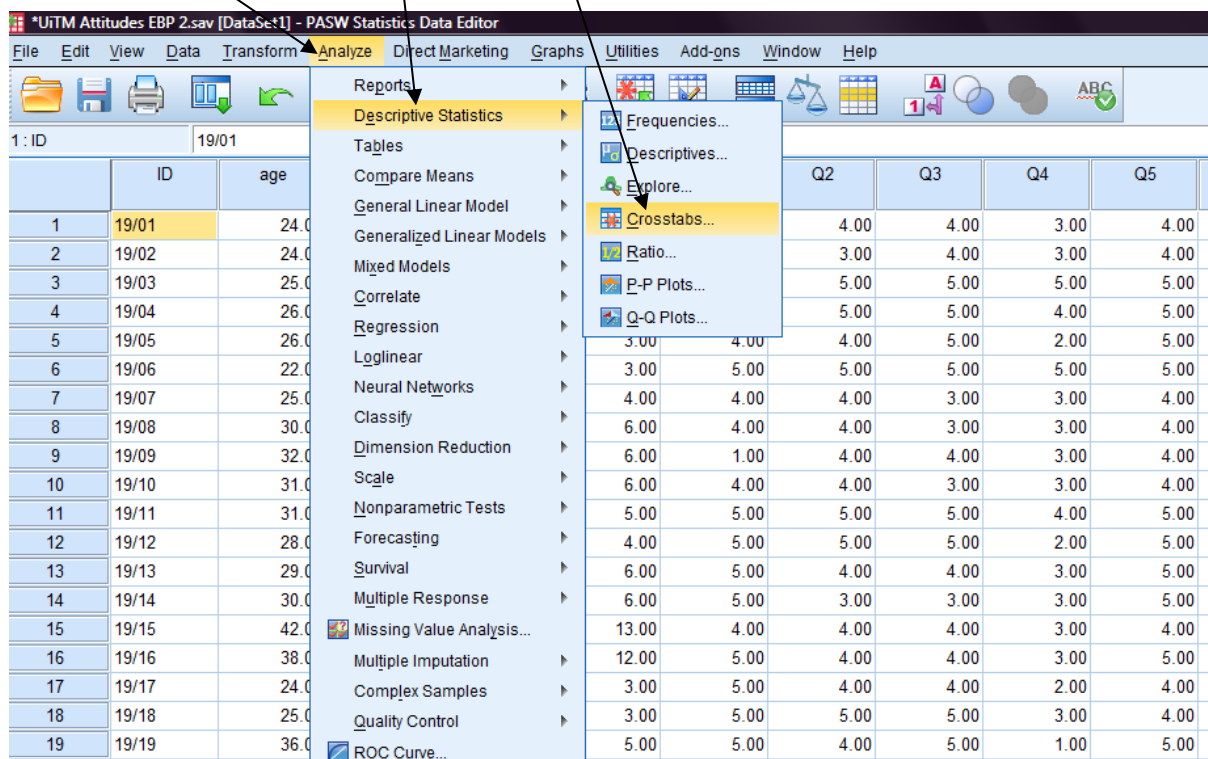
	Mean	SD	Min	Max
Age				
Length of Experience				

So far we have looked at variables individually. This is often referred to to **univariate** analysis. We are now going to look at some **bivariate** analysis – ie looking at the interactions between 2 variables (remember we are still looking at descriptive statistics so we are not yet looking at cause and effect).

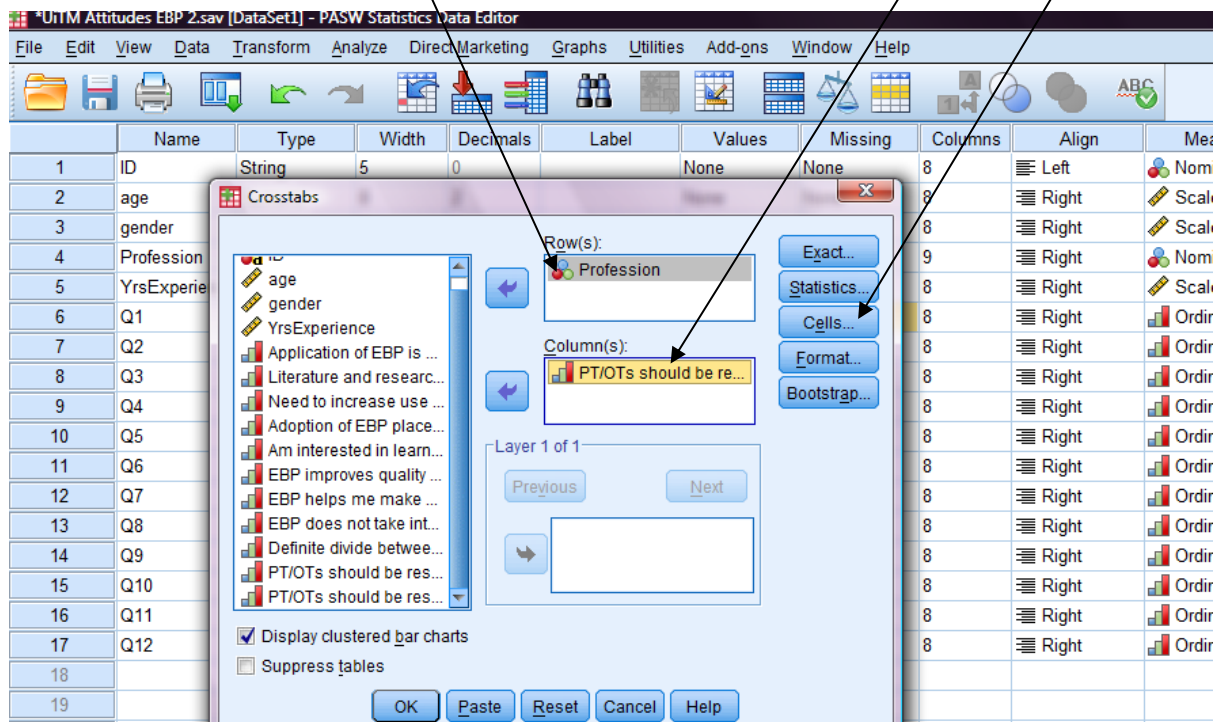
Crosstabulation – nominal data

We want to know if there is a relationship between **Profession** and the following statement “PT/OT should be responsible for own literature searches”. As both variables are **categorical** (what does this mean?) we will carry out a **Crosstabulation** by:

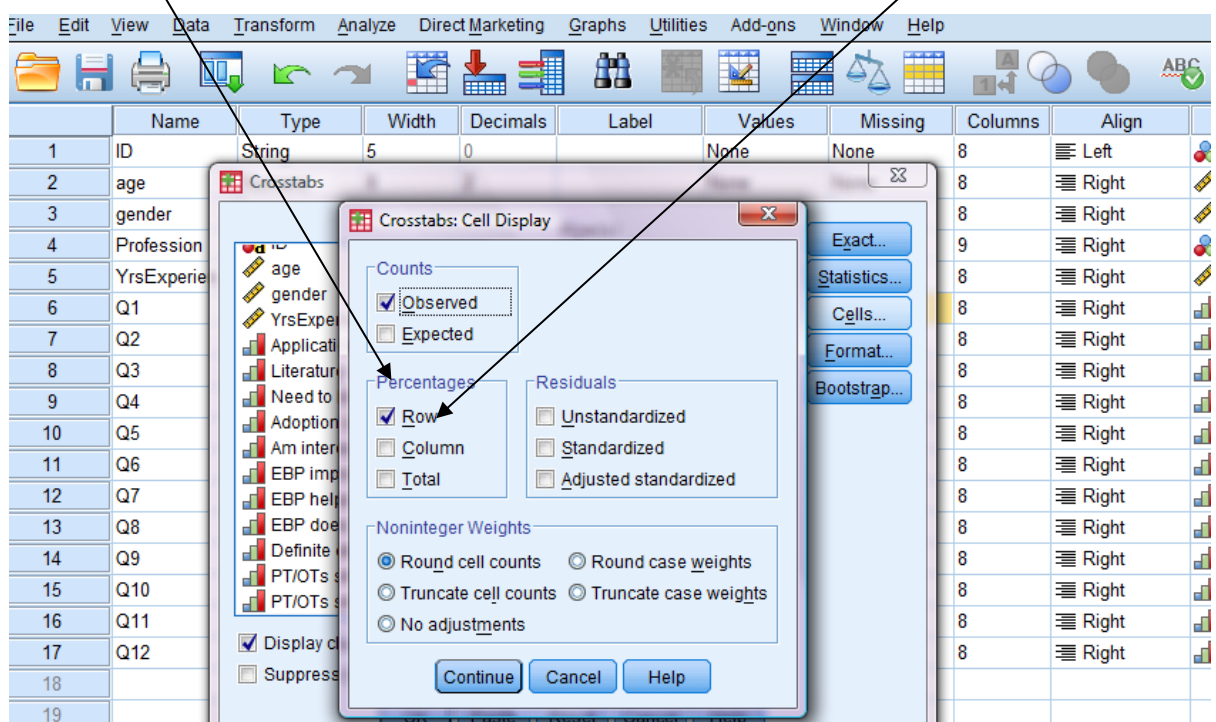
Selecting – **Analyse – Descriptives – Crosstabs.**



Now move the variable **Profession** into the Rows box, and the variable **Q10 (PT/OT should be responsible for own literature searches)** into the columns box. Next click on **Cells**



As there are unequal number of OTs and PTs in the group we can ask SPSS to calculate percentages of OTs/PTs that agree/disagree etc. We do this by ticking the **Row** in the **Percentages** box. Click **Continue** then **OK**.



Now complete the table below:

Table 2 : Crosstabulation Profession: “EBP does not take into account patient preferences”

		EBP does not take into account patient preferences				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Profession	OT					
	PT					

Q2. What do the results suggest?

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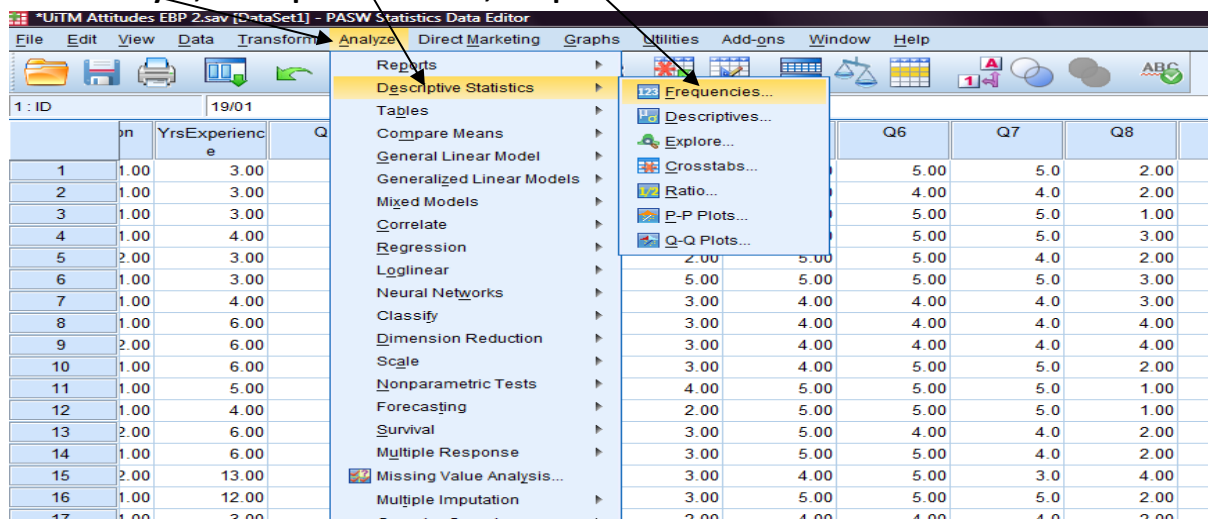
The Crosstabulation we have just carried out looked at the relationship between 2 **categorical** variables (**one nominal and one ordinal**).

Summarising the results of multiple Dependent Variables.

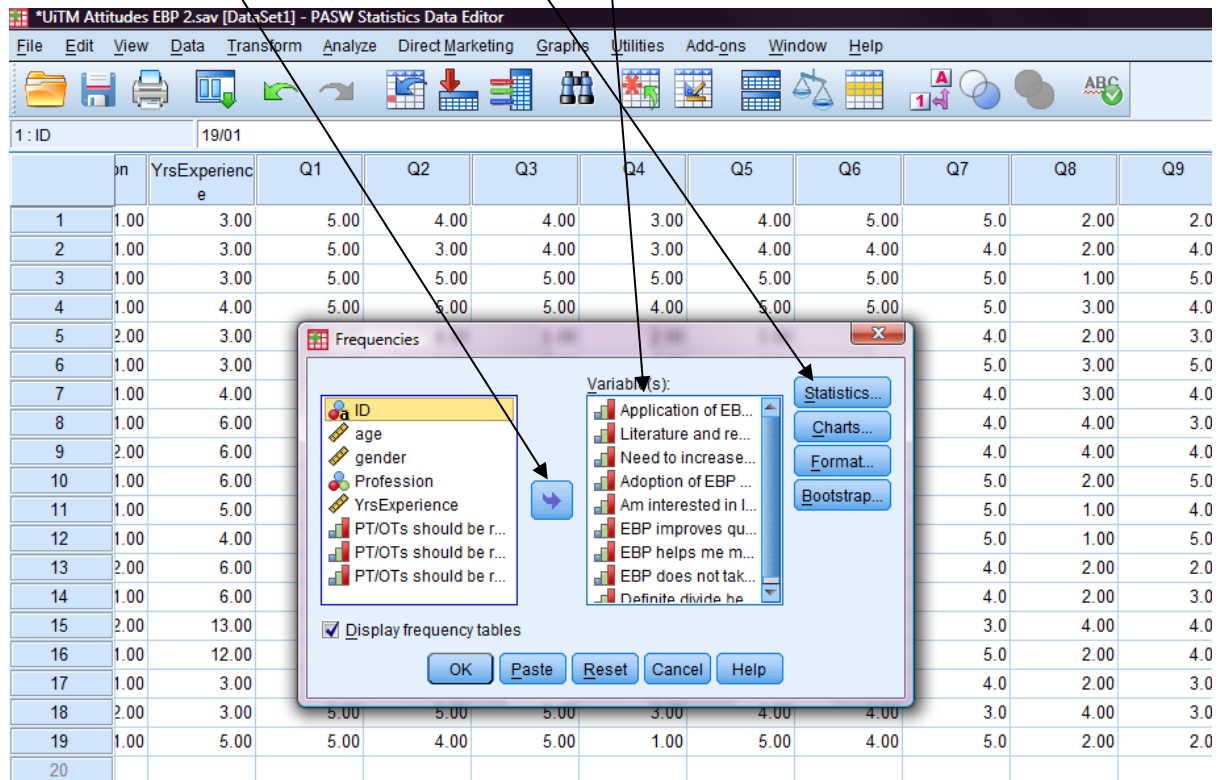
On the questionnaire variables Q1 – Q9 looked at the attitudes towards EBP whilst Q10-Q12 asked participants about whether they thought certain activities were their own responsibility.

We will now summarise the results of Q1-Q9 within a table (we are not separating this by profession we are simply summarising the responses of the participants). We could provide a table that summarises the category responses of all these variables (and I have included an example in the answers section) however, as these variables are **ORDINAL** level data then the appropriate summary statistic is the **MEDIAN**. You should additionally include information about the range of the responses.

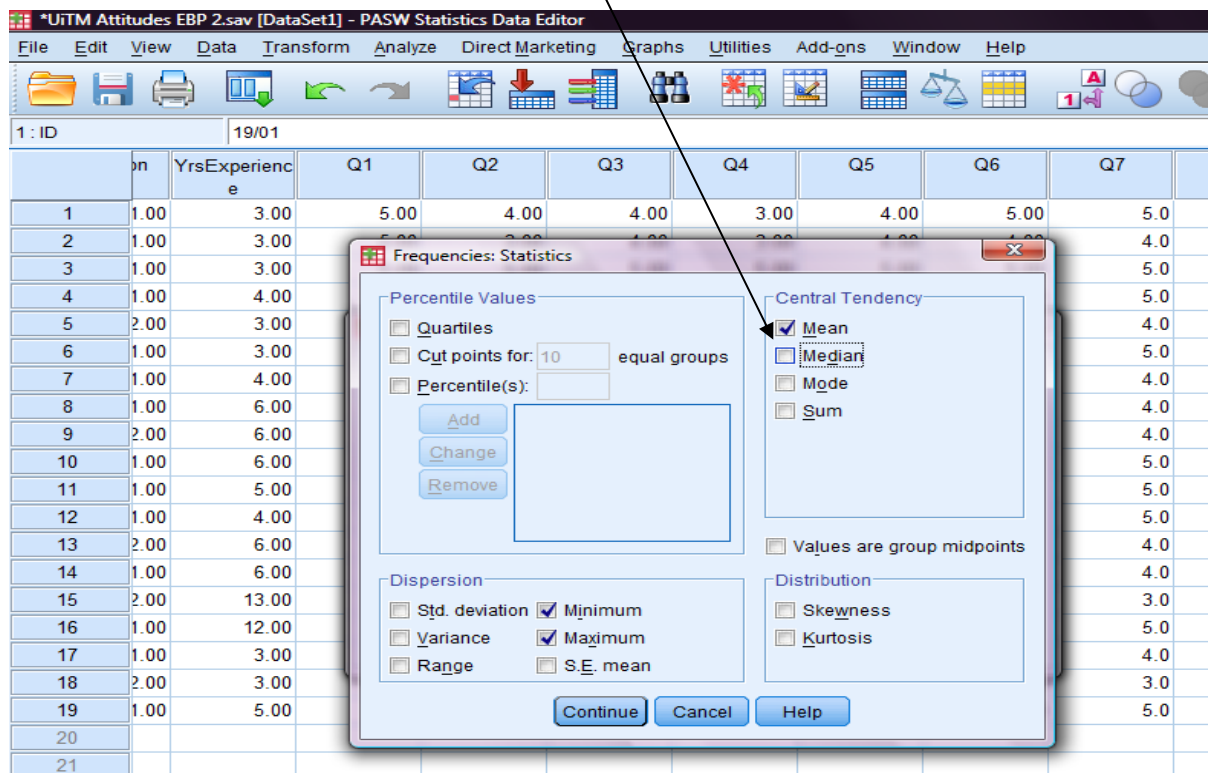
Select **Analyse, Descriptive Statistics, Frequencies**



Highlight the variables relating to question **Q1-Q9** and move then to the variables box by clicking on the arrow. Click on **Statistics**



Change the choice of statistic from **Mean** to **Median** by selecting the relevant boxes. Click on **Continue** and **OK**.



Now complete the following table:

Table 3 – Summary of Q1-Q9

Question	Median	Min	Max
Application of EBP is necessary			
Literature and research findings useful in daily practice			
Need to increase use of evidence in daily practice			
Adoption of EBP places unreasonable demand on PT/OT			
Am interested in learning skills to incorporate EBP in practice			
EBP improves quality of patient care			
EBP helps me make decisions about patient care			
EBP does not take into account patient preferences			
Definite divide between research and practice			

Q3. What do the data above show?

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Positive and negative statements

Remember when we discussed questionnaire design we stated that questions could be positively or negatively worded and that negative statements were often used to ensure that participants were answering questions accurately. From the statements in the table above (Table 3) identify the statements as follows:

+ indicates a positive attitude towards EBP

-indicates a negative attitude towards EBP

Was it easy to do this? Which statement /statements (if any) were difficult for you to determine?

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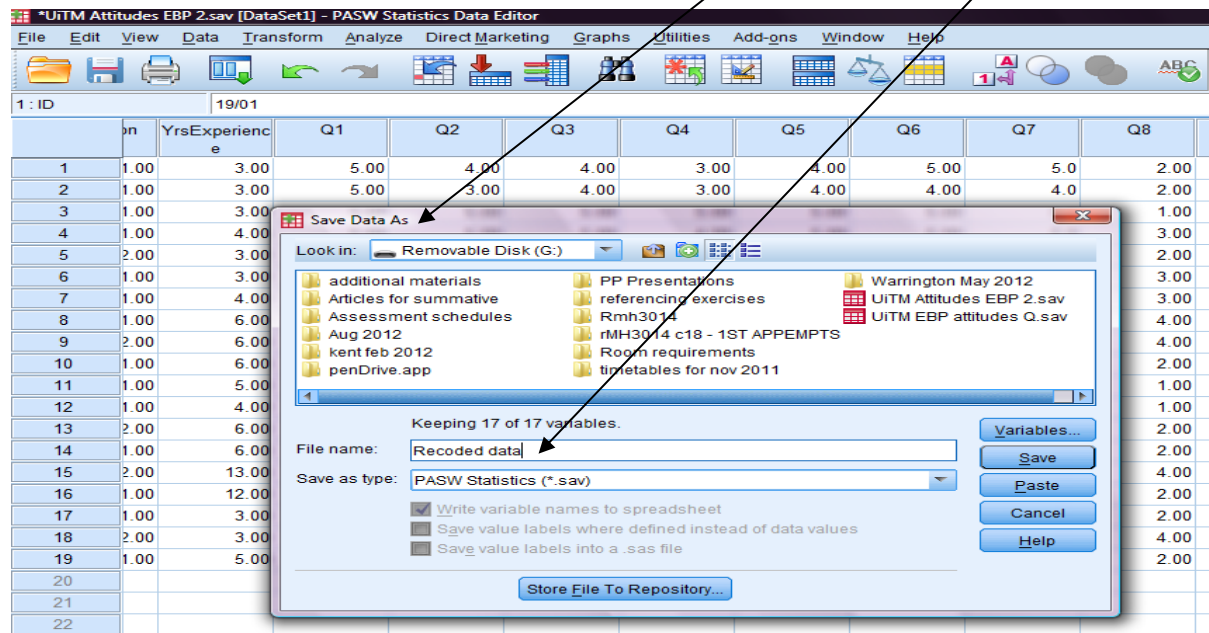
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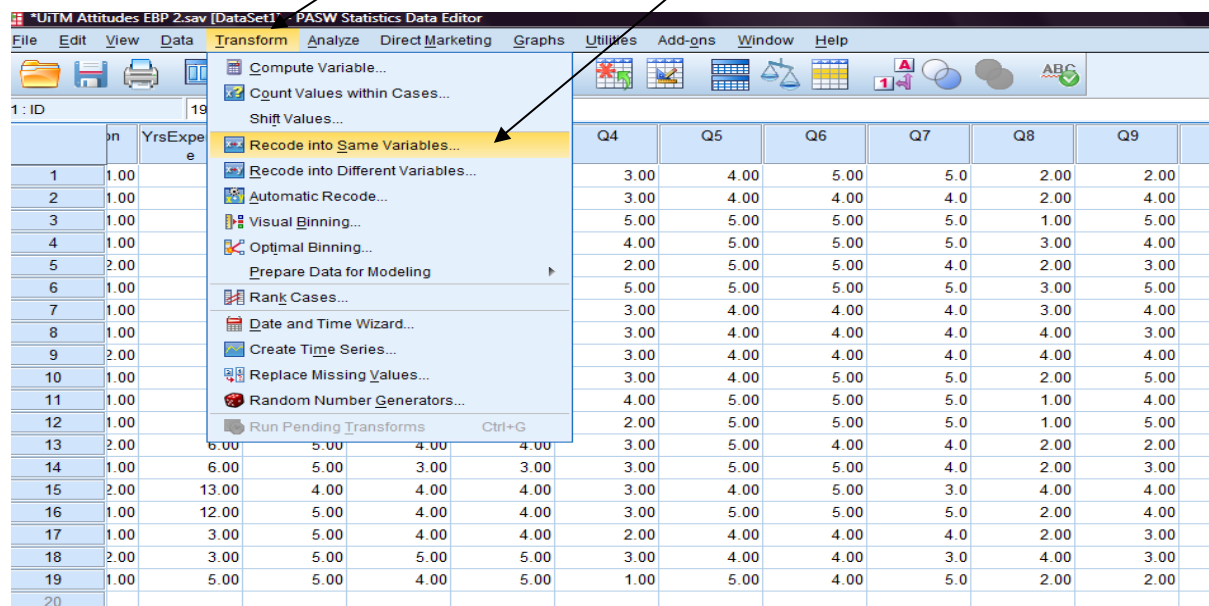
.....

We need to “Re-code” negative statements ie if a HIGH SCORE represents a POSITIVE ATTITUDE towards EBP then we need to change the coding for these variable ie Q4, Q8 and Q9. (Participants who had a positive attitude towards EBP would have ticked 1 or 2 for these items. If we want to total all of these scores together (eg 9 questions maximum score 45) then we need to change these scores.

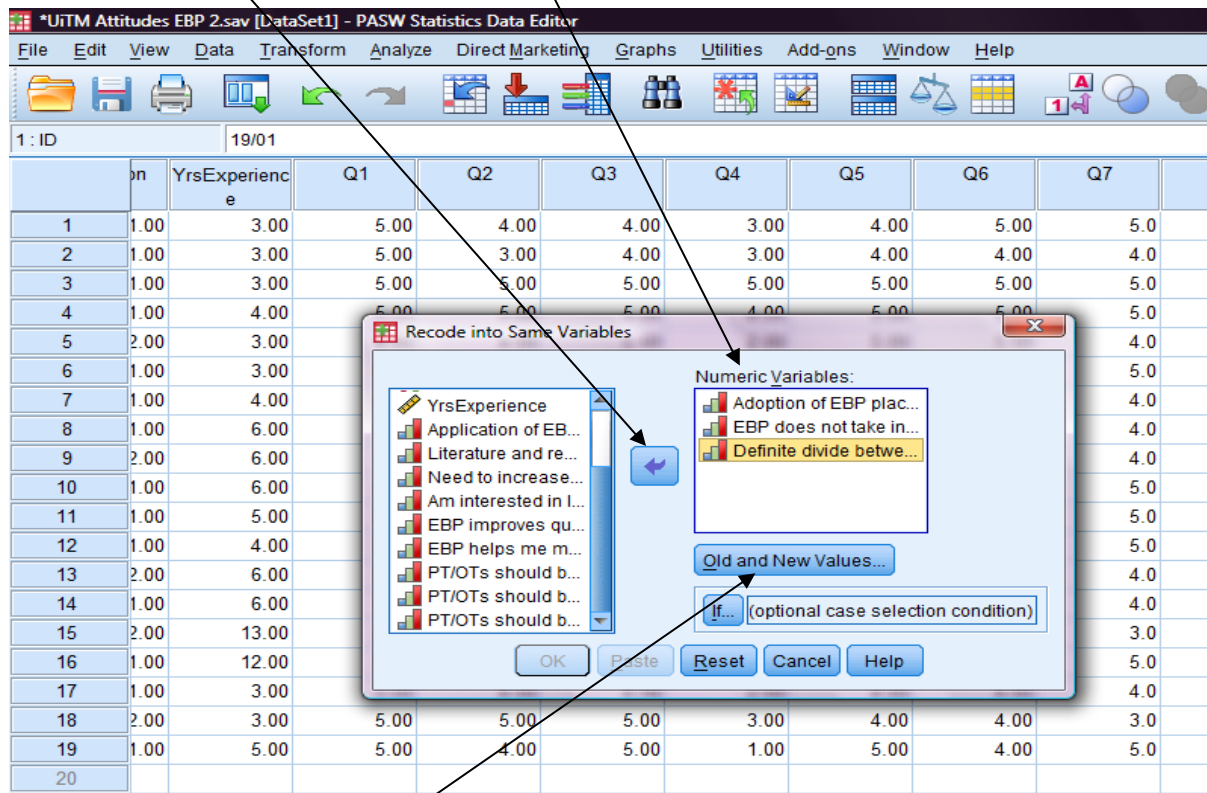
Before we go ahead with this next stage save your file and then **Save Data as “Recoded data”** as any actions you carry out at this stage cannot be undone – by saving your file you keep the original data intact.



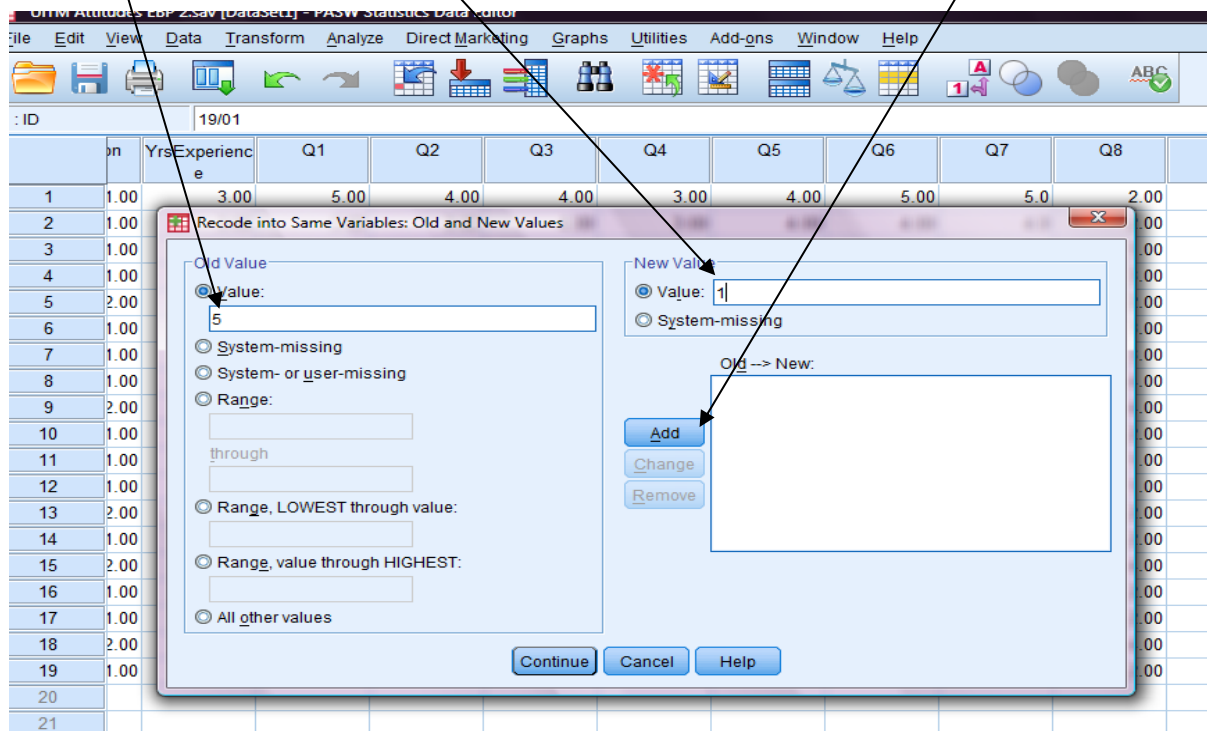
To re-code the variables select , **Transform** then **Recode into Same Variable**.



Move **questions 4, 8 and 9** the **Numeric Variables** box by highlighting them in the left and clicking on the arrow. You will need to move each variable separately.



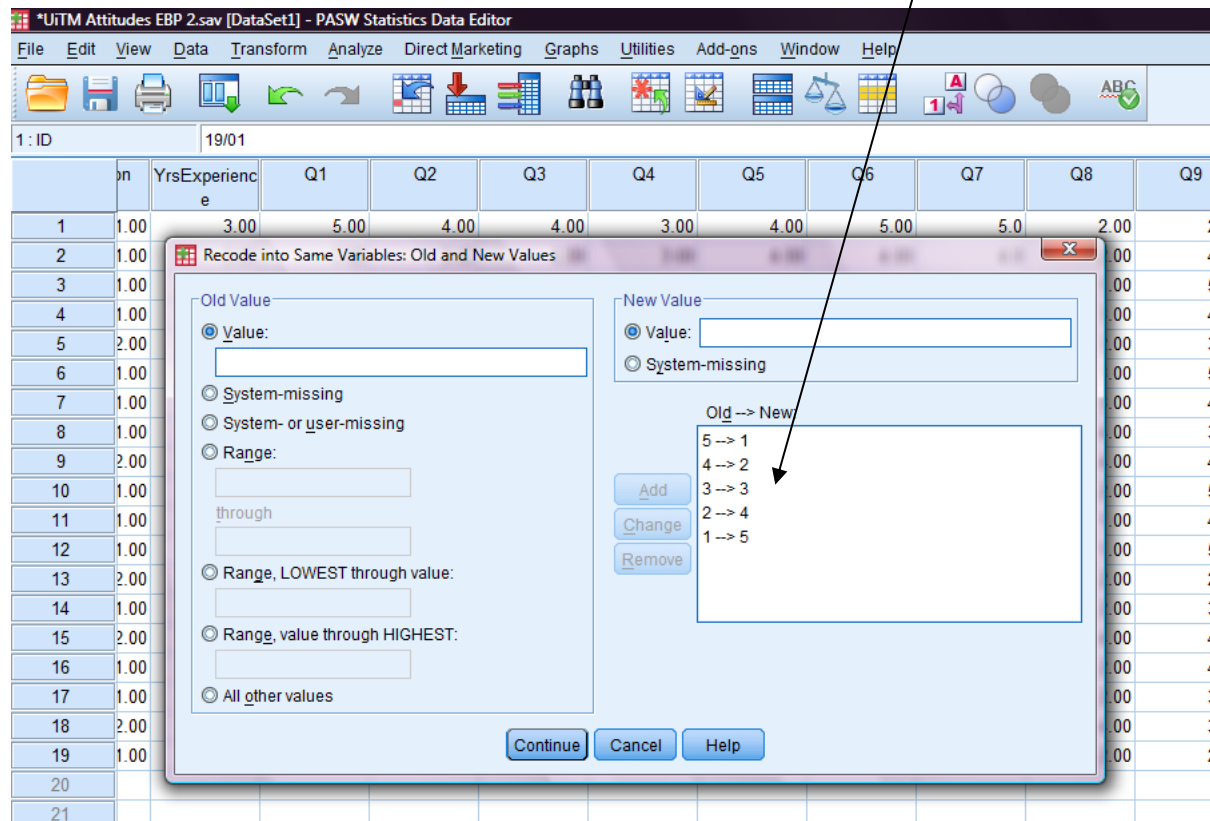
Then click on **Old and New Values**. We are going to reverse the scores for each category so type in **5** in the **Old Value** and **1** in the **New Value** box. Then click on **Add** then **Continue**



Repeat this process until you have entered the following:

- Old value 4 = New value 2
- Old value 3 = New value 3 (you can leave this out as it stays the same)
- Old value 2 = New value 4
- Old value 1 = New value 5

Don't forget to click on Add after each one. These will now show in the box below. Check that all your values are correct before proceeding. If they are correct click on **Continue**.

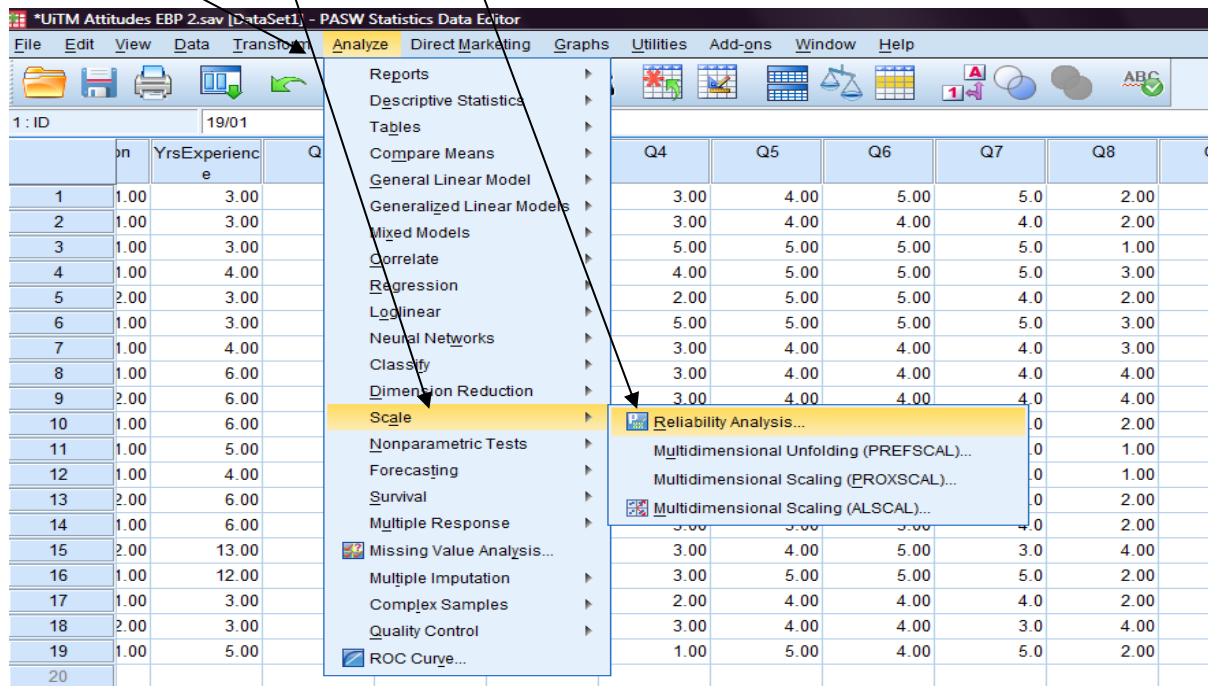


Now that we have reverse code these items we are going to run a reliability check for these 9 questions of the questionnaire.

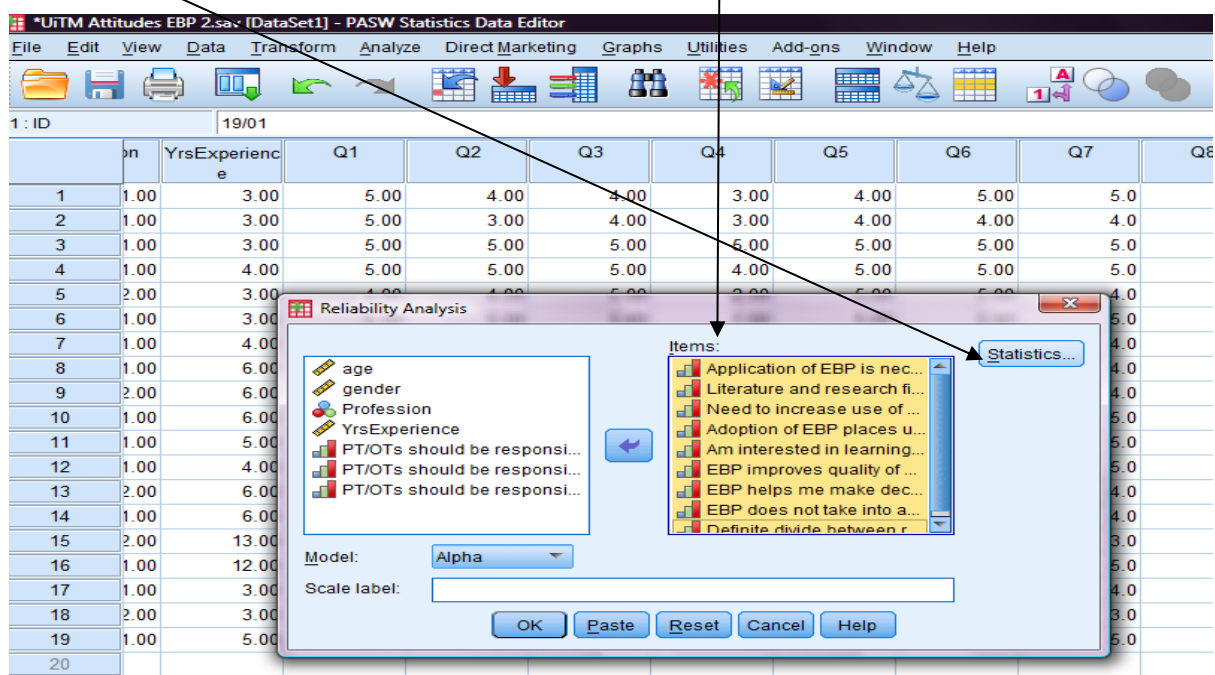
Cronbachs alpha

To see if the questions are being answered correctly we can carry out a test that will identify any problematic questions.

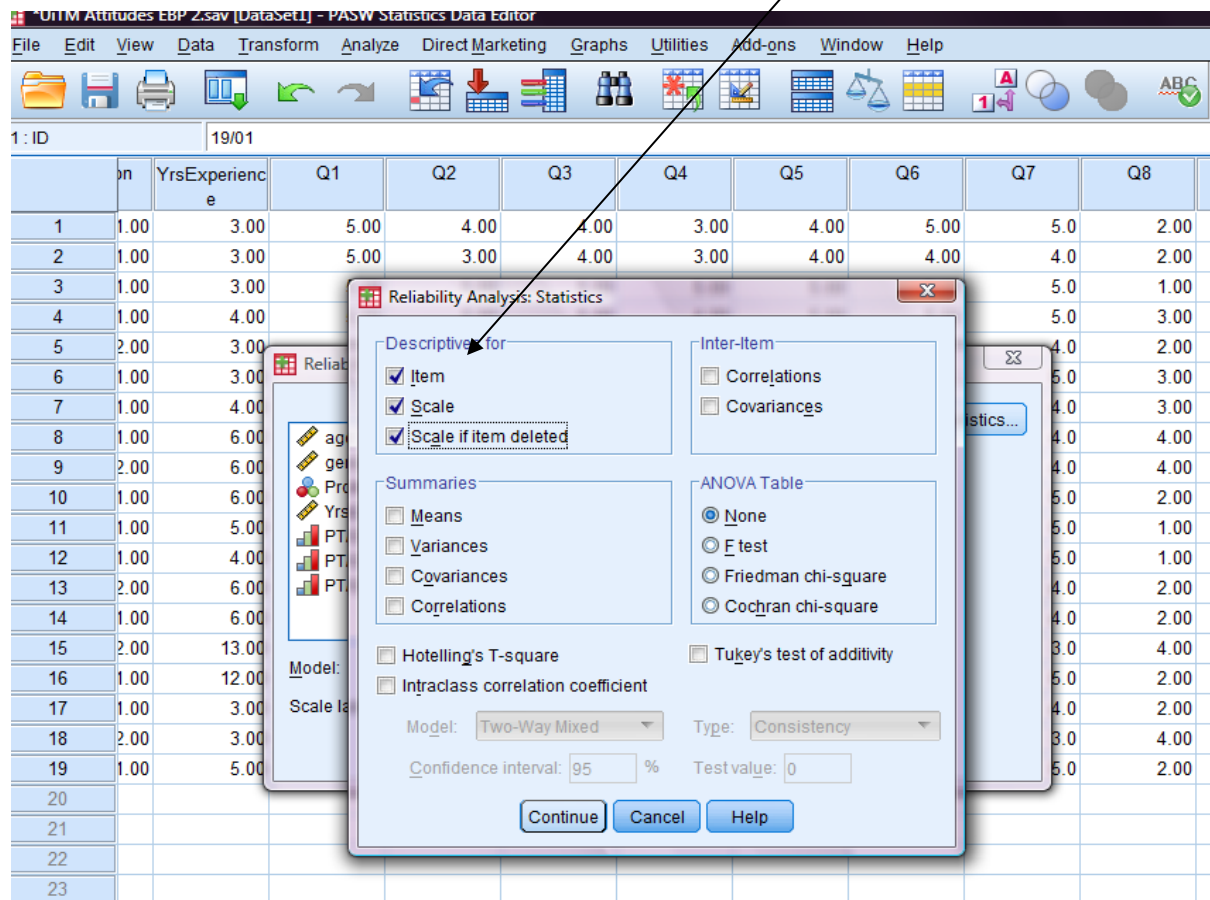
Click on **Analyze**, **Scale**, **Reliability Analysis**



Highlight variable **Q1 – Q9** and move these to the **Items** box by clicking on the arrow, then select **Statistics...**



Now select the following, **Item, Scale, Scale if item deleted** as shown below. Click **Continue** and then **OK**



The data from the Cronbachs alpha is quite detailed but this is what you need to know:

Cronbachs alpha is **0.569** which represents **9** questions.

Reliability Statistics	
Cronbach's Alpha	N of Items
.569	9

Now we know from class that the alpha co-efficient (which ranges from 0-1) should be more than 0.7 for the **internal consistency** to be good (Remember this?)

So at 0.569 – do you think this is good?

The table below shows each statement (ie Q1 to Q9) and in the right hand column shows what the new Cronbachs alpha will be if the item is removed. In other words it identified statements that are not being answered in line with the other questions.

We can see that **2 statements** if removed individually would increase the alpha coefficient to **0.655**

tem-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Application of EBP is necessary	30.7895	8.287	.502	.452
Literature and research findings useful in daily practice	31.1053	10.988	.148	.567
Need to increase use of evidence in daily practice	31.1053	9.322	.429	.491
Adoption of EBP places unreasonable demand on PT/OT	32.3684	11.690	-.094	.655
Am interested in learning skills to incorporate EBP in practice	30.7895	9.731	.629	.477
EBP improves quality of patient care	30.7368	10.982	.228	.552
EBP helps me make decisions about patient care	30.9474	9.719	.426	.500
EBP does not take into account patient preferences	31.7368	7.760	.566	.421
Definite divide between research and practice	32.9474	11.497	-.075	.655

If both of these items are removed we would expect the alpha coefficient to increase to more than 0.655 – possible even to **more than 0.7**.

Can you think of an explanation for why these questions/statements are different to the remainder of the statements?

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To remove these items select **Transform, Scale, Reliability Analysis** as before.

Highlight question 4 and click on the **arrow** in the centre to move it **back** to the left hand box.

Reliability Analysis

Items:

- age
- gender
- Profession
- YrsExperience
- PT/OTs should be responsi...
- PT/OTs should be responsi...
- PT/OTs should be responsi...

Model: Alpha

Scale label:

OK Paste Reset Cancel Help

Repeat the same for question 9 and then re-do the Cronbachs alpha test.

The new alpha coefficient should now be **0.788** from **7** questions

Reliability Statistics	
Cronbach's Alpha	N of Items
.788	7

(The table on the following page shows that there are now no further questions causing a "problem" with the data.)

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
Application of EBP is necessary	25.4737	8.596	.477	.776
Literature and research findings useful in daily practice	25.7895	10.175	.410	.779
Need to increase use of evidence in daily practice	25.7895	9.175	.509	.762
Am interested in learning skills to incorporate EBP in practice	25.4737	9.708	.704	.742
EBP improves quality of patient care	25.4211	10.368	.489	.770
EBP helps me make decisions about patient care	25.6316	9.246	.603	.745
EBP does not take into account patient preferences	26.4211	7.813	.593	.749

ANSWERS

Appendix 1 – Answers & Completed tables.

Q1. No – this would only identify mistakes where the input value falls outside of the expected range. If you entered someone’s data as male instead of female (ie 1 instead of 2 in the case of our data-file) then you would not know you had done this unless you checked all data carefully.

Table 1 : Descriptive Statistics

This is the output from SSPSS:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
age	19	22.00	42.00	28.8421	5.31521
YrsExperience	19	3.00	13.00	5.1579	2.87254
Valid N (listwise)	19				

You should NEVER include these tables in your written work (eg your dissertation) you should extract the data you need and then include this in a table as shown below:

	Mean	SD	Min	Max
Age	28.8421	5.31521	22	42
Length of Experience	5.1579	2.87254	3	13

Table 2 – Gender vs “EBP does not take into account patient preferences”

This is the output from SPSS – as you can see none of the respondents disagreed or strongly disagreed with this statement and therefore these values are not represented in the SPSS table.

Profession * PT/OTs should be responsible for own literature reviews to address their clinical questions

			PT/OTs should be responsible for own literature reviews to address their clinical questions			Total
			neutral	agree	strongly agree	
Profession	PT	Count	4	6	4	14
		% within Profession	28.6%	42.9%	28.6%	100.0%
	OT	Count	0	4	1	5
		% within Profession	.0%	80.0%	20.0%	100.0%
Total		Count	4	10	5	19
		% within Profession	21.1%	52.6%	26.3%	100.0%

Table 2 : Crosstabulation - Gender: "OT/PT should be responsible for own literature searches"

		EBP does not take into account patient preferences				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Profession	PT	0	0	4 (28.6)	6 (42.9)	4 (28.6%)
	OT	0	0	0	4 (80%)	1(20%)

Q2. In terms of Table 2 the data suggests that with the exception of 4 participants who were unsure, all participants agreed/strongly agreed that the OT/PT should be responsible for carrying out their own literature searches.

**** PLEASE TAKE CARE** to note that the sample size for this study is very small and therefore any results should be treated with caution.

Summarising the results of multiple questions.

The following table summarises the main findings of the result and should be used if the study you are undertaking is a descriptive study as it provides the full breakdown of responses (you could then express these as percentages)

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Application of EBP is necessary	1	0	0	5	13
Literature and research findings useful in daily practice	0	0	2	11	6
Need to increase use of evidence in daily practice	0	0	4	7	8
Adoption of EBP places unreasonable demand on PT/OT	1	3	11	2	2
Am interested in learning skills to incorporate EBP in practice	0	0	0	9	10
EBP improves quality of patient care	0	0	0	8	11
EBP helps me make decisions about patient care	0	0	2	8	9
EBP does not take into account patient preferences	3	9	3	4	0
Definite divide between research and practice	0	3	5	7	4

The table on the following page shows the median value for each question (remember a response of **1=strongly disagree whilst 5 = strongly agree**):

Question	Median	Min	Max
Application of EBP is necessary	5	1	5
Literature and research findings useful in daily practice	4	3	5
Need to increase use of evidence in daily practice	4	3	5
Adoption of EBP places unreasonable demand on PT/OT	3	1	5
Am interested in learning skills to incorporate EBP in practice	5	4	5
EBP improves quality of patient care	5	4	5
EBP helps me make decisions about patient care	4	3	5
EBP does not take into account patient preferences	2	1	4
Definite divide between research and practice	4	2	5

Q3. What do the data above show?

For most questions the responses are high (ie 4/5) which indicates that participants strongly agree/ agree with the statement, however for Q8 the median response is 2. This reflects the fact that for Q8 (and also Q4 and Q9) the wording is negatively stated compared to the remainder of the statements which reflect a positive attitude to EBP.

Cronbachs alpha

Regarding the 2 questions/statements that were removed from the questionnaire. If we examine them we can see that it is possible to have a positive attitude towards EBP whilst still feeling that:

The demands in terms of work are high AND that there is a divide between practice and research.

